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Blöte and Nienhuis reply

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Blöte and Nienhuis Reply: The results reported by Kondev and Henley in the preceding Comment [1] constitute very interesting additional information on the fully packed loop (FPL) model [2–6]. Not only did they for the case $n = 2$ confirm analytically our numerical values [6] of the central charge and exponents, they also obtained additional exponents. The explicit equivalence of the FPL model to a solid-on-solid (SOS) model with two-dimensional height variables, is very clarifying.

Kondev and Henley [1] raise the question why the critical dimension $X = \frac{2}{3}$ governing the asymptotic behavior of the color-color correlation function [5] does not show up in our results [6]. This dimension is smaller than the temperature dimension X_t , and the corresponding transfer-matrix eigenvalue should therefore dominate. The explanation lies in the fact that, in the spectrum of the loop model transfer matrix, the eigenstate corresponding with $X = \frac{2}{3}$ is *not translationally invariant*. In contrast, the transfer-matrix results presented in our Letter apply to translationally invariant eigenstates [6].

Using the language of the loop representation, empty bonds correspond with one of the three colors. Thus one can explicitly compute color-color correlations using the transfer matrix for the $n = 2$ FPL model wrapped on a cylinder. We performed such calculations using finite sizes $L = 3, 6, \text{ and } 9$. The results for the correlation

length agree very well with the presence of a color dimension $X = \frac{2}{3}$.

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